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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/725,572	11/30/2000	Keun No Park	2658-0246P	9754

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EXAMINER

ROMAN, ANGEL

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 05/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/725,572

Applicant(s)

PARK, KEUN NO

Examiner

Angel Roman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 February 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 13 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Okumura et al. U.S. Patent 5,015,330.

Okumura et al. discloses a method to prevent generation of contaminating particles in a chamber, the method comprising; mounting a substrate within a chamber; evacuating an ordinary gas within said chamber thereby decreasing a pressure within the chamber (see column 10, lines 65-68); injecting a treatment gas into said chamber to treat a surface of a substrate; and withdrawing said treatment gas from said chamber while injecting a moisture displacing gas comprising nitrogen into said chamber (see column 11, lines 1-37).

3. Claims 1 and 4 are rejected under 35 U.S.C. 102(e) as being anticipated by Kannan et al. U.S. Patent 6,091,056.

Kannan et al. discloses a method of preventing generation of particles in a chamber, the method comprising; mounting a substrate within a chamber of a gas-exposure equipment; decreasing a pressure within the chamber; injecting a surface treatment gas including HMDS gas into the chamber; and drawing out the surface treatment gas from the chamber while injecting a nitrogen gas into the chamber (see column 2, lines 60-67-column 3, lines 1-16). The step of injecting the surface treatment gas converts the surface of the substrate into an organic material.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2, 3 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kannan et al. U.S. Patent 6,091,056 in view of Bellows et al. U.S. Patent 5,728,602.

Kannan et al. is applied as above but lacks anticipation on disclosing information regarding reaching a pressure equal or higher than an atmospheric pressure in the chamber when a surface treatment gas is drawn out by injecting a moisture displacing gas into the chamber.

With respect to reaching atmospheric pressure in a chamber when a surface treatment gas is drawn out by injecting a moisture displacing gas into the chamber, Bellows et al discloses introducing nitrogen gas into a chamber until ambient pressure is attained (see column 4, lines 36-49). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to purge a surface treatment gas with nitrogen to cause the pressure in the chamber to become equal to an atmospheric pressure in the primary reference of Kannan et al. because this will allow subtraction of substrates from the chamber (see column 1, lines 56-59).

Regarding drawing out a surface treatment gas causing a pressure in a chamber to become higher than an atmospheric pressure, it is not patentable subject matter to discover the optimum processing ranges, i.e. pressure, using routine experimentation. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to cause a pressure in a chamber to become higher than an atmospheric pressure when a surface treatment gas is drawn out by injecting a moisture displacing gas into the chamber in the primary reference of Kannan et al. because this will contribute to a dislodging and removal of contaminated particles (see column 5, lines 50-54).

The subject matter in claims 6-8 is drawn to an apparatus (chamber). No weight is given to apparatus limitations in method claims (see *In re Edwards* 128 USPQ 387 (CCPA 1961)), therefore no patentable weight is given to claims 6-8. Furthermore it is well known to use chambers comprising evacuation lines and ejection lines to supply and evacuate gases into and out of a chamber, therefore it would have been obvious to

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a person having ordinary skills in the art at the time the invention was made to use an ejection line to apply the nitrogen through an ejection line and evacuation lines to evacuate a gas in the primary reference of Kannan et al. because is a conventional method use in the art to introduce or extract gases from a chamber.

6. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. U.S. Patent 5,015,330 in view of Kannan et al. U.S. Patent 6,091,056 and Bellows et al. U.S. Patent 5,728,602.

Okumura et al. is applied as above but lacks anticipation on using a treatment gas comprising HMDS; disclosing a pressure within a chamber rising to be equal to or above an atmospheric pressure as a moisture displacing gas is injected into said chamber.

Regarding using a treatment gas comprising HMDS, Kannan et al. discloses using an HMDS prime process during a semiconductor wafer processing. In view of this disclosure it would have been obvious to a person having ordinary skills in the art at the time the invention was made to use a treatment gas comprising HMDS as disclose in Kannan et al. in the primary reference of Okumura et al. because it would improve adhesion properties (see column 3, lines 12-14).

With respect to reaching atmospheric pressure in a chamber when a surface treatment gas is drawn out by injecting a moisture displacing gas into the chamber, Bellows et al discloses introducing nitrogen gas into a chamber until ambient pressure is attained (see column 4, lines 36-49). In view of this disclosure, it would have been

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obvious to one of ordinary skill in the art at the time the invention was made to purge a surface treatment gas with nitrogen to cause the pressure in the chamber to become equal to an atmospheric pressure in the primary reference of Okumura et al. because this will allow subtraction of substrates from the chamber (see column 1, lines 56-59).

Regarding drawing out a surface treatment gas causing a pressure in a chamber to become higher than an atmospheric pressure, it is not patentable subject matter to discover the optimum processing ranges, i.e. pressure, using routine experimentation. In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to cause a pressure in a chamber to become higher than an atmospheric pressure when a surface treatment gas is drawn out by injecting a moisture displacing gas into the chamber in the primary reference of Okumura et al. because this will contribute to a dislodging and removal of contaminated particles (see column 5, lines 50-54).

7. Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kannan et al. U.S. Patent 6,091,056 in view of the prior art disclosed in pages 1-4 of the specification [hereinafter Prior Art].

Kannan et al. is applied as above but lacks anticipation processing a substrate comprising a thin film transistor including at least one of a gate electrode, a source electrode, a drain electrode, and a pixel electrode; and processing a substrate comprising a color filter substrate including at least one of a color filter and a black matrix.

Regarding processing a substrate comprising a thin film transistor including at least one of a gate electrode, a source electrode, a drain electrode, and a pixel electrode, Prior Art discloses processing a substrate comprising a thin film transistor including at least one of a gate electrode, a source electrode, a drain electrode, and a pixel electrode (see figure 1). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to process a substrate comprising a thin film transistor including at least one of a gate electrode, a source electrode, a drain electrode, and a pixel electrode as disclose in Prior Art in the primary reference of Kannan et al. because these are conventional integrated circuits devices use in the semiconductor industries.

With respect to processing a substrate comprising a color filter substrate including at least one of a color filter and a black matrix, Prior Art discloses processing a substrate comprising a color filter substrate including at least one of a color filter and a black matrix (see page 2, lines 20-25). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to process a substrate comprising a color filter substrate including at least one of a color filter and a black matrix as disclose in Prior Art in the primary reference of Kannan et al. because these are conventional integrated circuits devices use in the semiconductor industries.

Response to Arguments

8. Applicant's arguments filed 2/11/02 have been fully considered but they are not persuasive.

With respect to applicant argument regarding claims 13 and 14 rejected under 35 U.S.C. 102 (b) as being anticipated by Okumura et al., that Okumura et al. discloses exposing the inner portions of the container to atmospheric air prior to the removal of the plasma process gases; Okumura et al. discloses steps of introducing the process gas and reacting gas, forming a film, purging with nitrogen (drawing out remaining gases while introducing nitrogen) and then, wafer unloading; furthermore Okumura specify that the steps are executed in the named order (see column 11, lines 27-37), therefore remaining process gases are purge with nitrogen prior to downloading the wafers. Furthermore Okumura et al. clearly specify that the reaction container is not open to air (see abstract and column 3, lines 45-57). Regarding Applicant argument that claim 13 recites a moisture displacing gas rather than nitrogen, in claim 14 Applicant claims the moisture displacing gas being nitrogen, therefore applicant argument regarding nitrogen does not have fundament since nitrogen is a moisture displacing gas.

Applicant argument with respect to claims 1, 4 and 5 rejected under 35 U.S.C. 102 (e) as being anticipated by Kannan et al., that Kannan et al. does not disclose "drawing out the surface treatment gas from the chamber while injecting a nitrogen gas into the chamber", Kannan et al. clearly discloses drawing out (purging) a surface treatment gas from a chamber with nitrogen gas. For clarification purposes, the

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definition of purge has been included in the list of reference cited, purging with nitrogen means replacing a remaining gas with nitrogen, therefore the gas is going to be drawn out while the nitrogen gas is introduced.

Claims 2-3 and 6-8 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Kannan et al. in view of Bellows et al.. Applicant argues that there are gases remaining in the furnace when the nitrogen is added in the Bellows et al. reference. Bellows et al. clearly discloses removing TEOS gas and its gaseous reaction products (drawing out the surface treatment gas from the chamber) from the chamber and injecting nitrogen to reach atmospheric pressure (see column 4, lines 37-45). Furthermore the Bellows et al. reference is used in combination with the primary reference of Kannan et al. to make reference to the conventional process of disclosing reaching atmospheric pressure after a nitrogen purging process, which is not specified in the Kannan et al. reference.

With respect to claims 9-12, rejected under 35 U.S.C. 103(a) as being unpatentable over Kannan et al. in view of the prior art of Applicant's disclosure, Applicant argues that the background art has not been admitted as "prior art", Applicant clearly states that "LCD's have been used in..." (see page 1) and also describes figure 1 as a conventional TFT, therefore Applicant is aware of the prior art disclosed in the Background of the invention section in the specification. Furthermore Kannan et al. discloses processing flat panels displays, which conventionally include the semiconductor substrates in claims 9-12.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Rubin et al. discloses a process of priming wafers with HMDS and using nitrogen to purge a reaction chamber after the priming process.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Angel Roman whose telephone number is (703) 306-0207. The examiner can normally be reached on Monday-Friday 8:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (703) 308-3325. The fax phone numbers

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for the organization where this application or proceeding is assigned are (703) 308-7724 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

AR
April 30, 2002



RICHARD BOOTH
PRIMARY EXAMINER